

CHAPTER 6 HEALTHY ADULTS

Goal: To improve the health of adults, and, by 1990, to reduce deaths among people ages 25 to 64 by at least 25 percent, to fewer than 400 per 100,000.

The contrast is sharp. For an infant at birth, life expectancy since 1900 has increased 26 years. But today for a man at age 45 the expectancy is only five years greater than it was in 1900.

On the one hand, preventive measures have been successful in reducing infant and childhood deaths from what were the major threats in those years, the acute contagious diseases. On the other hand, treatment measures, even though increasingly sophisticated, have been far less successful against what are the prime threats for adults: the chronic diseases, often of insidious onset, slowly progressive, ultimately devastating.

Only recently have we gained significant insights into the causes and many risk factors involved in the chronic diseases--and into tangible, applicable preventive measures. Although those measures are different and the results may be less immediately dramatic than was the case for the acute childhood diseases, we already have reason for optimism in what has been happening very recently to adult mortality trends.

In 1970, the death rate for adults aged 25 to 64 was even higher than in 1960 - 657 per 100,000, up from 640.

Since then, however, there has been an annual average decrease of 2.6 percent in the death rate

for adults. By 1976, the rate had dropped to 555. And data for 1977 show a further 2.7 percent decrease to 540 (Figure 6-A).

More than one-third of all deaths among the 100 million American adults have been due to cardiovascular diseases, principally coronary artery (heart) disease and stroke (Figure 6-C). And it is deaths from those causes which have been declining and accounting for most of the drop in mortality rate.

There is every reason to believe that the downward trend not only can be maintained but accelerated with increased efforts on behalf of such preventive measures as high blood pressure detection and control, reduction of smoking, prudent diet, increased exercise and fitness, and better stress management.

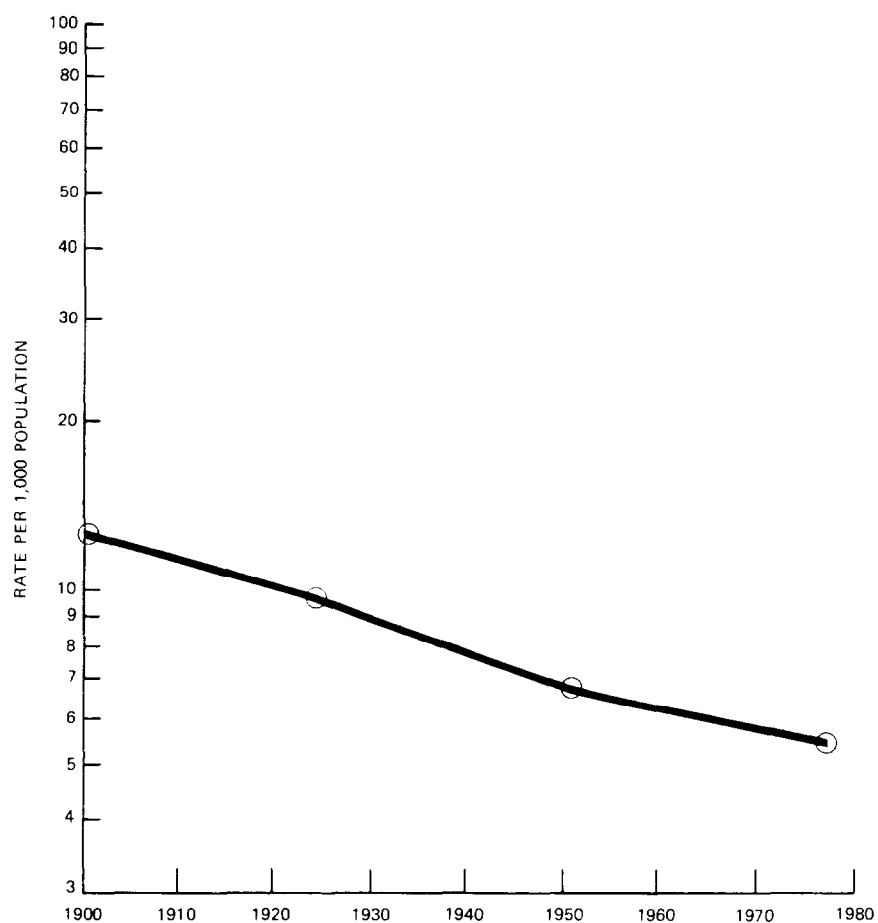
A reduction in cancer deaths should also be achievable--to a worthwhile, even if necessarily more limited, extent in the near future.

One reason for slower progress against cancer is that by the time malignancy becomes apparent, many years have gone into its development. In a sense, any currently appearing cancer reflects past history--perhaps, for example, 35 years of smoking in a 55-year-old patient with lung cancer. Therefore, it will take years for modifications of cancer risk factors to be expressed in marked reductions in cancer mortality.

A second reason is that declining rates for certain cancers will be more than offset by increases in occupational and smoking-related malignancies because of already-established adverse effects. The net result will be a small, gradual rise for the next few years in the age-adjusted death rate for cancer.

Prevention efforts--to reduce exposure to cancer-inducing agents and to foster more early detection and prompt treatment--need to be instituted now to reverse the trend.

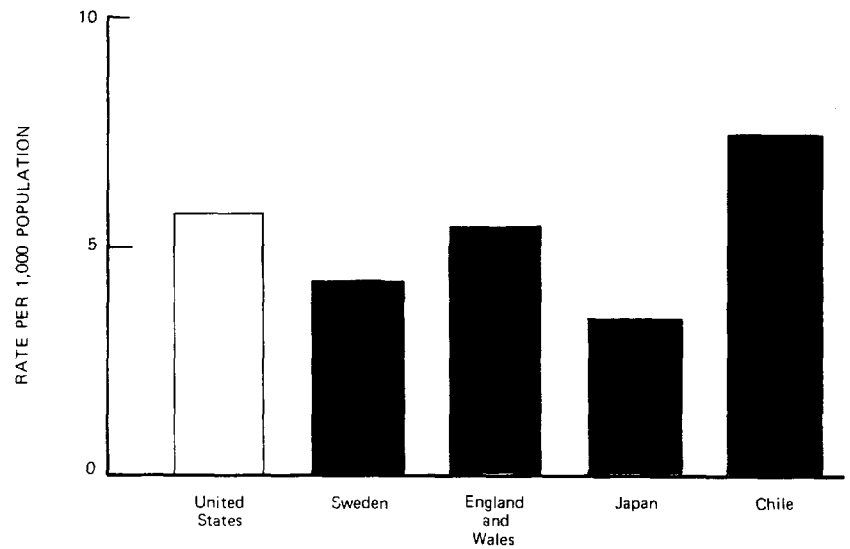
FIGURE 6-A
**DEATH RATES FOR AGES 25-64 YEARS: UNITED STATES,
SELECTED YEARS 1900-1977**



NOTE: 1977 data are provisional; data for all other years are final. Selected years are 1900, 1925, 1950, 1977.

Source: National Center for Health Statistics, Division of Vital Statistics.

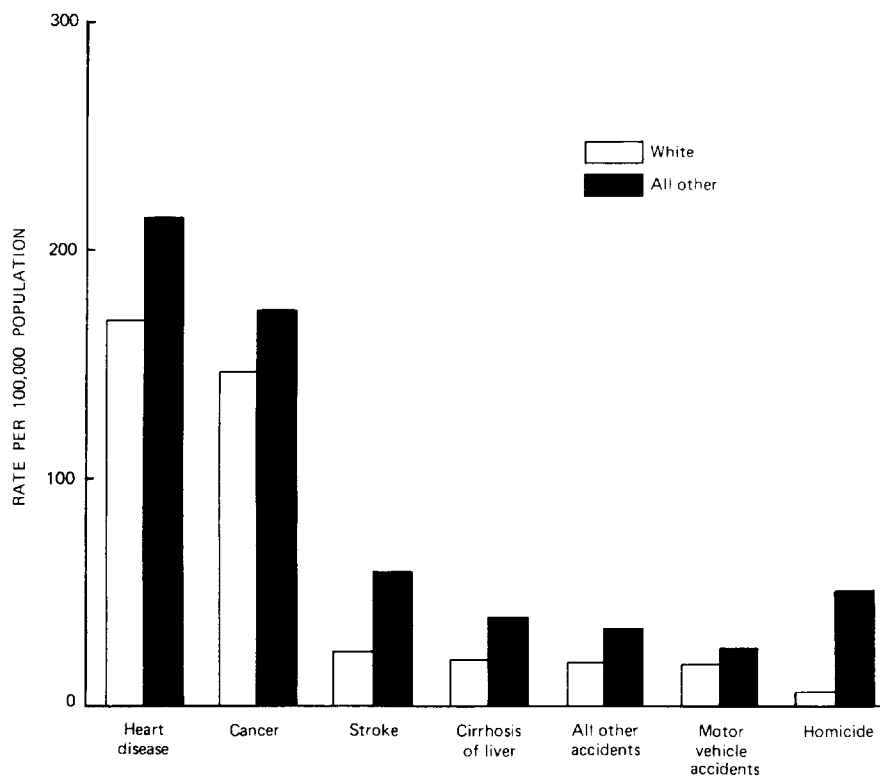
FIGURE 6-B
DEATH RATES FOR AGES 25-64 YEARS:
SELECTED COUNTRIES, 1975



NOTE: The most recent year of data for Chile is 1971.

Sources: United States, National Center for Health Statistics, Division of Vital Statistics; other countries, United Nations.

FIGURE 6-C
MAJOR CAUSES OF DEATH FOR AGES 25-64 YEARS:
UNITED STATES, 1976



Source: Based on data from the National Center for Health Statistics, Division of Vital Statistics.

Subgoal: Reducing Heart Attacks and Strokes

In 1977, heart disease was responsible for over 700,000 deaths--the leading cause of death for men after age 40. And although women, up to menopause, have about one-third the heart disease rate of men, their heart attack incidence thereafter increases, begins to approach the male rate by age 70, and virtually equals it by age 85.

Heart disease not only produces fatal heart attacks; it is also the greatest cause of permanent disability claims among workers under 65, and responsible for more days of hospitalization than any other single disorder. And it is the principal cause of limited activity for some 2.5 million Americans under age 65.

Stroke, in 1977, led to nearly 183,000 deaths, almost 10 percent of the total mortality for the year. Although some 250,000 Americans survive strokes each year, many remain disabled by paralysis, speech difficulties, and memory loss. Nearly 10 percent of nursing home admissions in people under 65 are because of strokes.

Although most stroke deaths (about 85 percent) occur in people over 65, early deaths are not uncommon, particularly among blacks who, between ages 25 and 64, have a stroke death rate almost 2.5 times that of whites.

But we are now beginning to see a welcome decline in death rates for both heart disease and strokes.

For heart disease, the death rate, which had been increasing rapidly after 1940 began to level off in the early 1960s and, between 1968 and 1977, fell by 22 percent. For stroke, the death rate, declining gradually over the last two decades, dipped more sharply, falling off 32 percent, between 1968 and 1977.

Behind both diseases lies the process of atherosclerosis in which critical arteries become narrowed by fatty deposits. Beginning silently, even as early as the first decade of life, atherosclerosis gradually thickens the walls of affected arteries with "plaques" which usually consist of a core of cholesterol and fats. The wall thickening progressively narrows artery diameter, reducing the amount of oxygen-carrying blood reaching the heart, brain or other parts of the body.

Manifestations do not usually appear until the disease process is well advanced and blood flow considerably reduced. Chest pain (angina pectoris) may appear when excitement, physical effort, or exposure to cold increases the heart's requirements for oxygen beyond the level that can be supplied by the impaired blood flow. Angina may be a forerunner of eventual heart attack--but heart attacks, frequently fatal, can occur suddenly, without warning, when an already narrowed coronary artery serving the heart is further blocked, completely shutting off flow to an area of the heart muscle.

A stroke occurs when the blood and oxygen supply to the brain is severely reduced. The mechanism can be similar to that of a heart attack--further blocking of an artery supplying brain tissue, usually an artery already compromised by atherosclerosis. Most strokes are of this type. A stroke may also occur when an artery ruptures in the brain and the hemorrhaging destroys brain tissue.

Risk Factors for Heart Disease and Stroke

The importance of risk factors is not in question. Each individually is clearly linked to increased likelihood of heart disease or stroke--and in combination they multiply the likelihood. What only remains uncertain is the precise extent to which risk can be decreased by modifying the risk factors.

Smoking. Since the late 1940s, research has consistently shown that cigarette smokers have

nearly twice the heart disease death rate of non-smokers. The difference is much greater in individuals under 65.

Substances in cigarette smoke which may be hazardous to the heart include nicotine and carbon monoxide.

Risk is proportional to the amount of smoke inhaled and the number of cigarettes smoked. Smokers of more than one pack a day are three times more likely to experience a heart attack than non-smokers (Figure 6-D). Pipe and cigar smokers have only slightly higher rates of coronary heart disease than non-smokers.

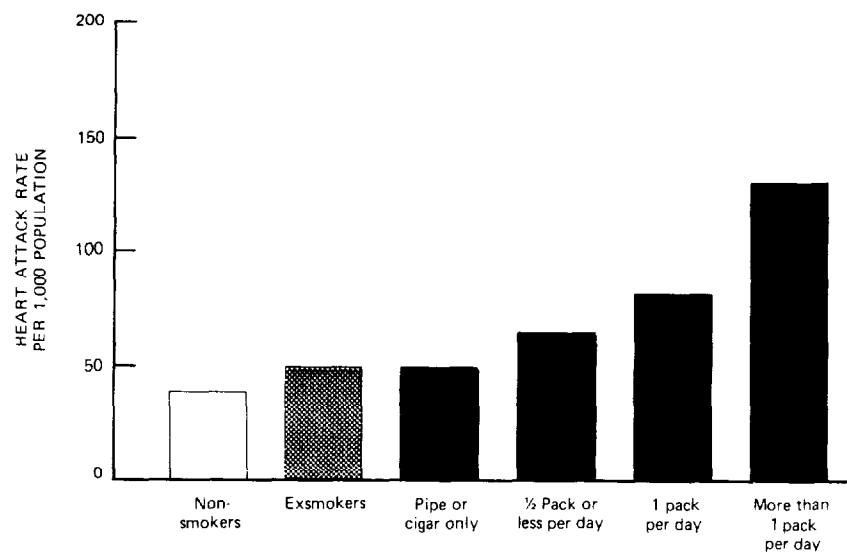
Hypertension. High blood pressure contributes to heart disease by putting an added burden on the heart which must pump against the increased pressure in the arteries and it also seems to be a factor in the thickening of artery walls. Hypertension increases risk of stroke by promoting the atherosclerotic process in arteries supplying the brain--and by contributing to the rupture of relatively fragile brain vessels.

A blood pressure measurement consistently over 140 systolic (the pressure when the heart contracts) and 90 diastolic (the pressure when the heart relaxes between beats) is usually considered abnormal. And people with pressures exceeding 160/95 are considered to have hypertension which would benefit from treatment. About 35 million Americans have pressures above 160/95.

A study in Framingham, Massachusetts, has shown that men aged 45 to 64 who have pressures of above 160/95 have two to three times the coronary heart disease rate of those with pressures under 140/90. Among people with systolic pressures above 160, strokes are three times as frequent as among those with systolic pressures under 140.

The high incidence of stroke deaths at younger ages among blacks is probably due in large measure

FIGURE 6D
AGE-ADJUSTED RATES OF FIRST HEART ATTACK
BY SMOKING STATUS FOR WHITE MALES
AGES 30-59 YEARS: UNITED STATES



NOTE: Age-adjusted to the United States white male population, 1960. Data based on the pooled results of five longitudinal investigations conducted in the 1950's and 1960's. Rates based on ten-year followup.

Source: National Cooperative Pooling Project, National Heart, Lung, and Blood Institute, 1970.

to the increased prevalence and severity of hypertension which occurs in black Americans for reasons not yet clear.

Cholesterol. Premature heart disease is unequivocally associated with elevated blood cholesterol levels. Stroke risk, too, is increased by elevated serum cholesterol, although the association is not as strong as for heart disease.

For American men, the average cholesterol level is about 220 mg/dl (milligrams of cholesterol in a deciliter of blood). Heart attacks are five times as frequent in men--and women--aged 35 to 44 who have cholesterol levels above 265 as among those with levels below 220. In general, the lower one's blood cholesterol the less the likelihood of heart disease; the higher the cholesterol level, the greater the risk.

It is cholesterol deposited from the blood which goes into atherosclerotic plaques. And cholesterol-carrier substances in the blood, called lipoproteins, have recently been found to play an important role in atherosclerotic disease. One type--low-density lipoproteins (LDL)--appears to accelerate cholesterol deposition in artery walls. However, another type--high-density lipoproteins (HDL)--appears not to hasten the process, and may even be protective.

Current research suggests that measuring HDL and LDL levels may be a more accurate means of predicting risk for atherosclerosis and heart attack than measuring serum cholesterol alone. Factors like exercise and perhaps even simple dietary modifications may increase the ratio of HDL to LDL and thereby possibly protect against heart disease.

Direct evidence from animal studies supports the linkage of atherosclerosis with high levels of fats (particularly saturated) and cholesterol in the diet.

Diabetes. Diabetes is a fourth important risk factor for cardiovascular disease. Diabetics have

more severe atherosclerosis, twice as many heart attacks, and about twice as many strokes as non-diabetics of the same age. For diabetic women, the risk of atherosclerotic disease is five times greater than for other women.

Diabetics are also more likely to be hypertensive and overweight. Control of blood pressure and elimination of smoking are especially important for them since these risk factors still further heighten their premature death rate.

Other risk factors. Although they may be somewhat less important in their effects than the four major risk factors just noted, other risk factors for coronary heart disease include overweight, physical inactivity, personality patterns which are related to stress, genetic predisposition, and oral contraceptive use.

Even a moderate excess of weight may be associated with increased levels of very low-density lipoproteins in the blood and with high blood pressure and high blood sugar. Still undetermined is whether physical inactivity--which may be associated with excess weight and elevated blood cholesterol, sugar, and blood pressure levels--independently increases the risk of premature heart attack or stroke.

All people face ordinary stresses of life and work. Some, however, invoke additional, extraordinary stresses. Typically, they are extremely ambitious, competitive, and impatient, and some studies indicate that they are at higher risk of coronary heart disease.

In some families, early heart attacks--before age 50--affect several closely related members, leading to the belief that a genetic predisposition to heart disease may exist. Hypertension, diabetes, and serum cholesterol abnormalities are, in some cases, known to be hereditary, but other genetic factors adding to heart disease risk have yet to be identified. Children of parents who have had heart

attacks before age 50 can be tested for relatively rare hereditary fat metabolism disorders. For most people, however, any contribution to risk made by genetic conditions is exacerbated by cigarette smoking, poor dietary habits, and other behavior that members of a family often share in common.

Some drugs may increase risk. A substantial increase has been noted in women who use oral contraceptives or estrogen replacements, and who may have other risk associations. For example, women aged 40 to 44 who both use oral contraceptives and smoke have about 10 times the risk of death from heart attack as women who do neither.

Subgoal: Reducing Death from Cancer

Cancer, the disease most feared by Americans and developed by one in four, claimed nearly 390,000 lives in 1977, making it the second most common cause of death. More than a third of deaths occur in the middle years (ages 35 to 64) of life. Although far more frequent among adults, cancer also occurs in children.

The most common fatal cancers are leukemia, kidney and nervous system malignancies in children; lung, intestine and breast cancer in adults; and cancer of the intestine, lung, prostate and uterus in older Americans. Almost half of all cancer fatalities in the United States are from three varieties: lung, large intestine, and breast.

All cancers are similar in apparently occurring when body cells begin to multiply without the usual internal restraints. The malignant cells push the normal out of the way, spread out, and even migrate to distant parts of the body.

The process can be relatively quick, as in some forms of leukemia. But for the most common types, including breast cancer, it is believed that 10, 15, even 25 years may pass before all of the steps in the biological chain of events leading to cancer are completed. Once they are, varying lengths of time

may elapse before enough cancerous cells accumulate to be recognized.

Cancer is not a single disease but rather a group of diseases occurring worldwide in man and all other mammalian species. Each type has its own rate of occurrence and often tends to affect certain population groups sharing particular characteristics.

Sex, race, and other hereditary factors as well as geographic, age, and occupational differences--when added to differences in habits and exposure to certain substances--provide clues to the origin, and prevention, of many human cancers. Many types of malignancies are not necessarily fatal. Some grow very slowly and rarely spread; others can be halted by prompt medical intervention.

Although much remains to be learned about cancer development, extensive research has established that in some cases something identifiable is responsible for changing the behavior of cells and stimulating their uncontrolled growth. A single cancer-inducing (carcinogenic) agent such as radiation may trigger this response. While in rare instances cancer may follow a single large exposure, usually it is due to repeated low-dose exposures.

Most carcinogens seem to have their major effect in specific parts of the body, often related to their mode of entry and their sites of activation, destruction and exit from the body. But cancer in any one site may result from combined effects of several agents or several events. And variations in the body's internal chemical environment or genetic predisposition also play a role in determining the response to potentially cancer-provoking stimuli.

While the number of cancer victims has increased dramatically in the past 40 years, much of the increase is due to population growth. When changes in the size and age composition of the American population are taken into consideration, overall cancer death rates have increased only slightly for men since 1937 and have actually decreased slightly for women.

Also changed over the past several decades have been the patterns of cancer types and incidences for men and women (Figures 6-E and 6-F) and for whites and other races. Men have more cancer of the lung, intestines, bladder and stomach than women and have higher overall cancer death rate--163 per 100,000 versus 137 per 100,000 for women. Whites tend to have higher rates than others of cancer of the breast, intestines, and bladder, but lower rates of cancer of the prostate, cervix, and stomach.

Cancer differences can be noted from one country to another. Compared to Japan, the United States has more cancer of the breast but less cancer of the stomach. Such variations in cancer types and death rates may be due to differences in hereditary, environmental and behavioral factors and/or use of early detection measures. The tendency of people who migrate to assume the cancer patterns of their new home provides some clues to cancer causes.

Risk Factors for Cancers

Among influences which have been identified as potential contributors to cancer development are cigarette smoking, alcohol, certain dietary patterns, radiation, sunlight, occupational hazards, water and air pollutants, and heredity and predisposing medical conditions.

Smoking. Cigarette smoking is responsible for more cancer and more cancer deaths than any other known agent. Not only do smokers have about 10 times the frequency of lung cancer; they also have three to five times as much cancer of the oral cavity, more than three times as much cancer of the larynx, and more than twice as much urinary bladder cancer as non-smokers.

Cigar and pipe smokers have lower malignancy rates than cigarette smokers except for cancers of mouth and lip for which their risk is approximately the same. The fewer cigarettes smoked, the less the risk. The risk also may be lower for smokers of filtered or low tar and nicotine cigarettes but

FIGURE 6E

**AGE-ADJUSTED CANCER INCIDENCE RATES BY SITE
FOR MALES: UNITED STATES, SELECTED YEARS, 1947-1976**

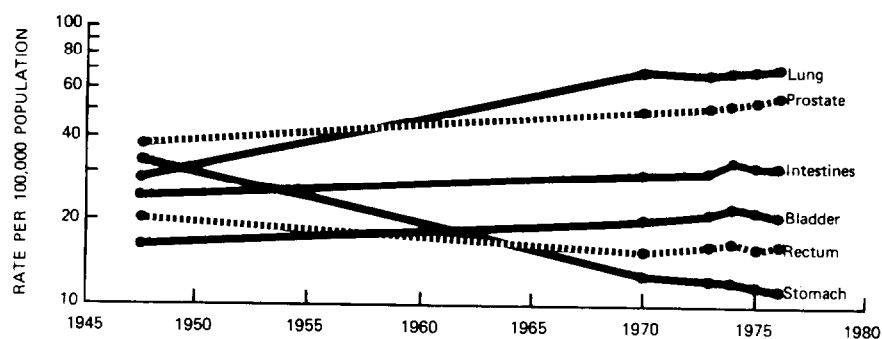
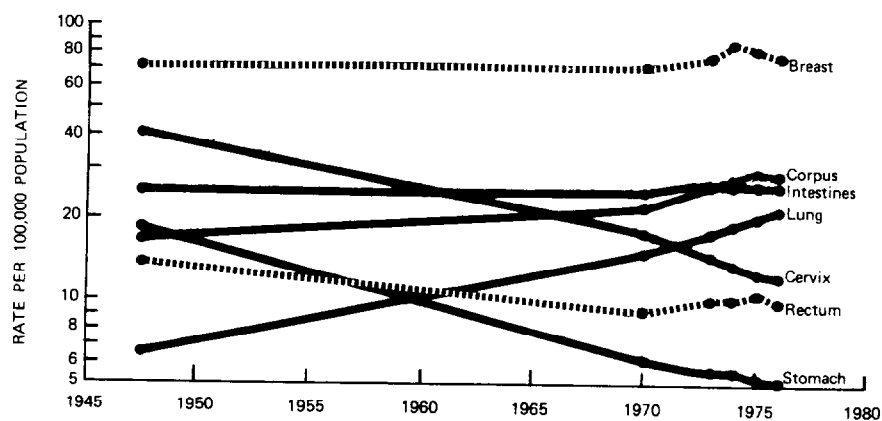


FIGURE 6F

**AGE-ADJUSTED CANCER INCIDENCE RATES BY SITE
FOR FEMALES: UNITED STATES, SELECTED YEARS, 1947-1976**



NOTE: All rates are age-adjusted to the 1960 United States population.

Source: Data for 1947-1948 are from the Second National Cancer Survey; for 1969-1971, from the Third National Cancer Survey; and for 1973-1976, from the Surveillance, Epidemiology, and End Results (SEER) Program, National Cancer Institute.

evidence is limited and risk is still much higher than for non-smokers.

Smoking also can multiply--in some cases many-fold--the risks associated with other carcinogenic agents. Heavy alcohol use, associated with esophageal cancer, has a greatly intensified effect when combined with cigarette smoking. People exposed to carcinogens on the job may have much greater risk if they also smoke. The combination, for example, of occupational exposure to asbestos and cigarettes increases lung cancer risk 90 times.

Alcohol. Higher rates of cancer of the larynx, oral cavity, and liver as well as of the esophagus occur among people consuming large amounts of alcohol. Whether the nutritional deficiencies sometimes associated with heavy drinking increase susceptibility to the effects of alcohol, tobacco, and other carcinogens, or whether alcohol itself causes the damage is yet unknown. Contaminants that accumulate during manufacture of most alcoholic beverages may be the harmful agents, rather than alcohol itself.

Diet. A role in cancer development has been proposed for components of diet--and for some methods of food preparation such as pickling and charcoal broiling.

Some of the information about dietary causes is based on animal studies and may have limited relevance to man. Other information comes from comparisons of human cancer rates in different countries and among migrants from one country to another.

The typical American diet includes foods containing many substances added to enhance taste, improve color, and retard spoilage--as well as residues of food packaging materials, materials added to animal feed, and other chemicals.

Some of these additives may actually help prevent cancers--notably antioxidants and those that prevent growth of molds which can produce carcinogens such as aflatoxin--but others may have

carcinogenic potential. Studies thus far have not been conclusive. But, because the number and amounts of additives were much less 30 to 40 years ago, and because malignancy can take that long to develop, careful scrutiny of the health effects of substances added to food is important.

Variation in rates of cancers (which differ greatly from country to country) may relate to differences in diet.

For example, people in Japan eat much less beef and total fat and more salt and pickled foods than Americans; they have much lower rates of breast and colon/rectum cancers, but higher rates of stomach cancer. These differences cannot be entirely genetic.

Among Japanese immigrating to the United States, rates for breast and colorectal cancers tend to increase while those for stomach cancer decline as eating habits become more like those here. Such trends are also found among immigrants from other countries. But the precise relationship between dietary differences and various cancers is still not known.

Radiation. A connection between exposure to radiation and cancer has been recognized ever since malignancies appeared in scientists and technicians who received large doses in their work with radium and early x-ray devices.

More recently, increased risk of cancer has been associated with radiation used for some diagnostic and therapeutic purposes. Because no radiation dose may be so small as to be risk-free and exposures are cumulative, some health professionals, while valuing x-ray procedures, have been working to reduce patient exposures. Much more can be done in this regard.

Other sources of low-level radiation to which the American population is exposed include those related to natural background radiation, nuclear weapons fallout, and nuclear energy.

Sunlight. Sunlight can cause skin cancer--and does among some people receiving large exposure, particularly outdoor workers. Americans living in the South and Southwest have much higher skin cancer rates than those in northern states. People with darker complexions are at lower risk. Protective clothing and sun lotions containing PABA (para-aminobenzoic acid) or other compounds that screen out harmful rays can help to prevent skin cancer, and premature aging of the skin.

Occupational exposure. Each year in the United States about 1,000 new chemicals are produced in commercial quantities. American workers are thus exposed to an ever-increasing number of materials that may have cancer-causing potential.

More than 200 years ago, an association between occupation and a specific cancer was recognized in the higher incidence of cancer of the scrotum among chimney sweeps. Since then, many substances have been found to produce cancer among workers in a wide variety of industries.

Occupational exposures can cause cancers which are rare in the general population--and, in the case of some exposures, can increase the incidence of a number of common types.

Working with asbestos without appropriate protection, for example, increases the incidence of the rare malignancy, mesothelioma, as well as of lung cancer. And, plastics workers exposed to vinyl chloride are at 200 times greater risk for liver cancer, four times greater risk for brain cancer, and two times greater risk for lung cancer than the general population.

Occupational exposures also may interact with other environmental hazards for a great multiplication of risk as in the case of cigarette-smoking asbestos workers.

Nor are hazards from industrial substances confined by workplace boundaries. Toxic materials may

pollute air outside as well as inside a plant, endangering nearby residents. For example, angiosarcoma, a rare liver cancer linked to vinyl chloride exposure, has been diagnosed among people living near vinyl chloride polymerization and fabrication plants.

Moreover, contaminants carried home on work shoes and clothes can threaten families. Documented cases of mesothelioma have been found among people whose only known exposure to asbestos has been through living in a home with an asbestos worker.

Water pollution. Potentially carcinogenic industrial and agricultural wastes--including chlor-dane, aldrin, dieldrin, and benzene--are found in some rivers and lakes from which drinking water is taken. Although their concentrations in drinking water usually have been much lower than those known to pose substantial risk, such substances can accumulate in water supplies and may become concentrated in fish or shellfish. Their increasing amounts--and varieties--make updating and enforcement of water quality standards essential.

Air pollution. Air quality varies greatly from place to place within the United States. Air pollution comes primarily from automobile exhausts, the burning of fuels, and industrial activities. Pollutants such as asbestos, beryllium, benzene, and other synthetic organic chemicals are potential carcinogens, and several studies suggest that higher levels of air pollution may be associated with increased lung cancer rates. The extent of increase has not yet been quantified but close monitoring of air quality is clearly indicated.

Heredity. Some cancers tend to run in families. Sisters and daughters of women with breast cancer, for example, are at higher risk for the disease.

But families often share environmental conditions and behavioral characteristics, making it difficult to determine how much of family clustering of cancer is really the result of heredity.

The significance of a family history varies from one type of cancer to another. Overall, only one or two percent of cancers are attributable primarily to heredity; in some rarer types, the percentage may be higher.

People with certain genetically-related conditions have a higher cancer incidence and are prone to develop malignancy earlier. One example is the predisposition of those with multiple intestinal polyps to cancer of the colon.

Cancers at Specific Sites

A great number of cancers and cancer deaths can be prevented through two strategies: limiting exposure to cancer-causing substances, and early detection and treatment before a cancer has spread.

Lung and urinary bladder cancers are amenable to the first strategy. More than 80 percent of all lung cancer and up to 50 percent of all bladder cancer could be prevented if people stopped smoking. Skin cancer also is largely preventable through avoidance of excessive sun exposure. Modifications in occupational exposure and diet may help to prevent other types of cancer.

Once cancer develops, many deaths can be prevented by early detection and treatment. For this, screening procedures must identify accurately people with cancer still in early enough stages to allow effective treatment. Available screening measures, more widely applied, could probably prevent a third or more of the deaths due to breast cancer in women over 50, most deaths from cervical cancer, and many of those due to prostate and rectal cancer.

Lung. Lung cancer, the most common lethal malignancy in the United States, accounted for four percent of total deaths and 25 percent of all cancer deaths in 1977. Approximately 80 percent of the 72,000 men and 23,000 women dying from lung cancer did so as a result of cigarette smoking. Early identification techniques--such as chest x-rays and

sputum examination--generally do not discover lung cancer before it has spread. The elimination of cigarette smoking and occupational exposures to carcinogenic substances is the best approach.

Breast. Affecting nearly one in 13, breast cancer is the most common malignancy for American women. Although more frequent in older women, it does not spare the young and, 28 percent of the time, affects women under 50. Definitive prevention by any simple means is not available--but risk of death from breast cancer can be reduced substantially by early diagnosis.

Several screening procedures are available--self-examination (most important), examination by a physician, and mammography (a type of x-ray screening).

Most breast cancers are first found by women themselves rather than by physicians during routine examinations. Women should examine their breasts once a month. Particular care should be taken by those with family histories of breast cancer. For women still menstruating, the best time is just after the period. Menopausal and postmenopausal women should choose a specific day of the month for breast self-examination so they are less likely to forget to do so. Although a lump, abnormal discharge, or size irregularity is usually a symptom of benign rather than malignant breast disease, a physician's examination is essential when any of these conditions is noted.

Periodic examination by a physician, in combination with mammography, increases the number of cancers identified early, before their spread.

Mammography may identify cancerous cell deposits too small to be detected even by careful physical examination. Among women over 50, it can contribute to reducing breast cancer death rates.

Mammography does use x-rays which, particularly in higher doses, may cause cancer, and frequent use

of the procedure carries a risk which must be weighed against potential benefits. Each mammogram may raise risk by a very small fraction. It has been estimated that if, for example, a woman has five mammograms, her chance of ever developing breast cancer would increase from 7.0 percent (no mammograms) to 7.35 percent.

Colon and rectum. Cancers of the colon and rectum, which make up 15 percent of all cancers and are the second most common cause of death from malignancy, affect 100,000 Americans and lead to 50,000 deaths annually. They are particularly common between ages 50 and 70. Early indications may include rectal bleeding and bowel habit changes.

Premature death from colorectal cancers can often be prevented by periodic medical examinations, including use of instrument examination (sigmoidoscopy or colonoscopy) when indicated, to detect early disease amenable to treatment. People with family histories of colorectal cancer have special need for periodic examinations.

People whose diet is relatively lacking in fiber may have a higher incidence of colorectal cancer. The evidence that high fiber diets will reduce the incidence is scanty at present, but such diets are prudent and are likely to reduce the chance of diverticulitis and hemorrhoidal disease.

Prostate. Prostate cancer incidence has been increasing over the past 40 years, especially for black men. Four-fifths of cases occur after age 65. Not enough is known about causes to permit a strategy of prevention.

The best available alternative is early detection and surgery. Considering improvements in treatment over the last 15 years, the outlook is far better when prostate cancer is still localized at the time of diagnosis. Rectal examination by a physician is the most reliable method of early detection and should be part of every physical exam for men after 40.

Cervix. Invasive cancer of the cervix affects 20,000 American women and causes over 7,500 deaths annually. Rates of incidence and death have declined substantially since the early 1950s.

Risk of cervical cancer seems to increase with a multiplicity of sex partners, early and frequent sexual activity, and multiple childbirth.

Although the reduction in incidence and death rates began before such early detection measures as the Pap (Papanicolaou) smear were widely used, these measures are probably responsible for at least part of the continuing decline.

The Pap smear--for analysis of cells from the cervix--has greater potential for reducing cancer deaths than any other screening method now available. Smears--which can detect cells with cancerous potential before they become invasive--should be taken at periodic intervals: for three consecutive years beginning at age 20, or at the beginning of sexual activity; then every three years until age 35, every five years to age 60, then again thereafter every three years. The screening frequency should be increased for women using oral contraceptives or estrogen therapy, and in those found to have pelvic abnormalities.

Urinary bladder. Bladder cancer, relatively common in men, led to an estimated 6,900 deaths in 1977. About 40 percent of cases occur before age 65 and the malignancy is most common in heavy smokers and individuals exposed to cancer-causing occupational chemicals.

Blood in the urine is the most common early sign--but it may also signify other conditions, some of which are not serious.

The key to prevention lies in reducing cigarette smoking and exposure to carcinogens in the workplace. Many deaths may be prevented through early detection and treatment.

The pattern of cancer incidence has varied widely--over time, across national boundaries, within subgroups in the population.

Only a small fraction of these differences can be explained by heredity. Environmental factors and factors in individual behavior appear to be the prime causes of most forms of cancer.

Therefore, many--perhaps even most--premature deaths due to cancer should be preventable.

Other Important Problems

Most notable among other problems posing threats to the health of adults are accidents (which have been considered in earlier chapters, and will be again in Chapter 9), alcohol abuse and mental illness. The latter two, as well as periodontal disease, deserve special comment here.

Alcohol Abuse

It is difficult to overemphasize the profound and pervasive influence of alcohol abuse as a cause of death for Americans.

There are an estimated 10 million problem drinkers in the country.

In 1977, more than 30,000 Americans died from cirrhosis of the liver--and 95 percent of the deaths were alcohol-related.

Alcohol is a contributor to several of the leading causes of death from age 15 to age 70, with direct responsibility for certain cancers of the liver.

It is a risk factor in various other cancers--and, rarely, in diabetes.

It is an indirect cause in almost 150,000 deaths annually from accidents, homicides, and suicides.

Alcohol abuse also is a contributor to family disruption, child and spouse abuse, unwanted pregnancy, rape, assault, other forms of violence, job instability, economic insecurity, and still other problems.

Drinking during pregnancy can cause abnormalities in the fetus, leading to mental retardation and other defects. And special problems are presented by the combined use of alcohol and sedatives.

Chapter 10 will look in detail at the demography of alcohol abuse in the United States and strategies for its control.

Mental Health

Mental illness is a substantial contributor to disability and suffering for American adults.

The President's Commission on Mental Health has reported that three percent of the population--nearly seven million people--sought treatment in 1975 by specialists in mental health and one to two million were hospitalized for mental problems in that year.

In 1974, five percent of persons reporting limitations on daily activities indicated mental and nervous conditions to be the cause. Surveys note a large proportion of patients in the general medical care system have some emotional or psychiatric problem.

The Commission's report also indicates that, at any given time, up to 25 percent of the population is estimated to be suffering from mild to moderate depression, anxiety, or other emotional disorder.

Depression and manic depressive disorders are among the most severe types of mental illness in terms of prevalence, economic cost, and mortality.

Of the 29,000 suicides recorded in the United States each year, more than 80 percent are believed to be precipitated by depressive illness. Severe depression or manic excitability handicaps an estimated two to four of every 100 adults at any given time.

Consistent relationships have been observed between mental disorders and factors such as sex, social class, and place of residence.

Women have highest rates of manic-depressive psychosis while men have relatively high rates of personality disorders. The incidence of psychiatric disorders is highest among people with lowest levels of income, education, and occupation. People in cities have higher rates of anxiety, mild depression, phobias, self-doubt and other symptoms of personality disorders, with only manic depressive psychosis apparently higher in rural areas.

There is persuasive evidence that appropriate treatment at the onset of acute psychosis can markedly influence its outcome.

Periodontal Disease

Disturbingly common among adults--and costly and difficult to treat--periodontal disease affects tissues supporting the teeth.

It is most often caused by bacterial deposits (plaque) on the teeth--and, in its most frequent form, gingivitis, produces inflammation of the gums, with redness, swelling, and easy bleeding tendencies.

Gingivitis often progresses to a more severe and destructive form of periodontal disease--periodontitis. At this point, bone and ligaments supporting the teeth are gradually destroyed and the teeth loosen or "drift."

In its most advanced form, the disease causes loss of teeth--and is, in fact, the prime reason for tooth loss after age 35. A recent survey found that more than 30 percent of Americans between ages 55

and 64, and 45 percent of those 65 to 74, have lost all of their natural teeth.

Careful and thorough daily brushing and flossing to remove bacterial plaque is effective in preventing and retarding progression of periodontal disease. Regular professional examination and treatment to remove hard deposits that form on teeth, correct predisposing factors, and repair existing damage are also essential for control of this disease.

Many adult health problems today--it bears reemphasizing--can frequently be controlled by the individual. And the measures required are often not particularly dramatic.

An individual's risk of disease can be substantially reduced (or increased) by a few simple personal decisions with respect to smoking, alcohol use, diet, exercise, seat belt use, and periodic screening for major diseases such as high blood pressure and cancer.

The potential exists to promote substantial changes in the profile of disease and disability among American adults. But collective resources will have to be mobilized to assist individuals seeking to enhance their prospects for better health, as well as to protect them from threats not within their control.

It is encouraging that many voluntary organizations, large businesses, and community agencies have undertaken programs to help people adapt lifestyles for a healthier life. With a broad-based effort to provide this kind of support, we can anticipate impressive gains in the health of adults.